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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,160	09/30/2003	Richard T. Modafferi	RM-101	8181

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MARK LEVY & ASSOCIATES, PLLC
PRESS BUILDING, SUITE 902
19 CHENANGO STREET
BINGHAMTON, NY 13901

EXAMINER	
FAULK, DEVONA E	
ART UNIT	**PAPER NUMBER**
2644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

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Office Action Summary	**Application No.** 10/677,160	**Applicant(s)** MODAFFERI, RICHARD T.
	Examiner Devona E. Faulk	**Art Unit** 2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 30 September 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The date is missing.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the term "substantially infinite" in claim 1 is a relative term which renders the claim indefinite. The term "substantially infinite" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1,2 and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by Combest (U.S. Patent 5,937,072).

Regarding **claim 1**, Combest discloses a crossover network for a loudspeaker system (Figure 3) comprising a low-frequency driver (woofer) (16, Figure 3; column 5, lines 28-30) and a high frequency driver (tweeter (24, Figure 3; column 5, lines 34-36) comprising a low-pass filter (14, Figure 3) operatively connected to said signal input and to said woofer for providing substantially only low-frequency signals thereto, said low-pass filter having a substantially infinite upper frequency slope (column 6, lines 7-15) and a high-pass filter (22, Figure 3) operatively connected to said signal input and to said tweeter, said high-pass filter having a relatively shallow lower frequency slope (column 2, lines 25-20).

All elements of **claim 2** are comprehended by claim 1 (Figure 3).

Regarding **claim 7**, Combest discloses a multi-driver loudspeaker system (Figure 3) comprising at least a woofer (16, Figure 3), a tweeter (24, Figure 3), and a crossover network operatively connected to each other thereof, said crossover network comprising a low-pass filter having infinite slope characteristics at its upper frequency slope and operatively connected said woofer, and a high-pass filter also having infinite slope characteristics at its lower frequency slope and operatively connected to said tweeter, the improvement comprising relaxing said infinite slope characteristic of said lower frequency slope of said high-pass filter (Figure 3, column 2, lines 20-40).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 3-6, 8-10** rejected under 35 U.S.C. 103(a) as being unpatentable over Combest (U.S. Patent 5,937,072) in view of Modafferi (U.S. Patent 4,771,466).

Claim 3 claims the crossover network of claim 2, further comprising at least one constant resistance network operatively connected to at least one of said low-pass filter and said high-pass filter so that said crossover network presents a substantially constant impedance at said signal input across a predetermined frequency range. As stated above apropos of claim 2, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 3 with the exception of the claimed matter. Modafferi discloses a multi-driver loudspeaker apparatus with improved crossover filter circuits and teaches of the concept of constant resistance (column 9, lines 1-5) and the loudspeaker apparatus covering a frequency range of 20Hz to 20KHz (column 24, lines 37-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to use Modifier's concept of a constant resistance as claimed because that it is conventional to the art that most passive crossover networks are synthesized on the basis that the network is terminated by a constant resistance.

Claim 4 claims the crossover network of claim 2, wherein said predetermined frequency range comprises a range of frequencies of between approximately 20 Hz and 20KHz. As stated above apropos of claim 2, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 2 with the exception of the claimed matter. Modafferi discloses a multi-driver loudspeaker apparatus with improved crossover filter circuits where the audible range of frequencies is 20Hz to 20KHz. It would have been obvious to one of ordinary skill in the art to have the speaker system able to cover a wide range of frequencies as claimed in order to have a system that can handle very low or very high frequencies.

Claim 5 claims the crossover network of claim 1, wherein said loudspeaker system further comprises a mid-range driver, said crossover network further comprising a mid-range band-pass filter operatively connected to said signal input and to said mid-range driver, said mid-range band-pass filter having a substantially infinite upper frequency slope and a relatively shallow lower frequency slope. As stated above apropos of claim 1, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 5 with the exception of a mid-range band-pass filter having a substantially infinite upper frequency slope and a relatively shallow lower frequency slope. Modafferi's discloses a midrange band pass filter and teaches that solving for a particular transfer function yields results that correspond to both an infinite band-edge slope and a finite band-edge slope (column19, lines 35-49). Although, he does not specifically discloses the claim language, it is obvious that the frequency slope(s) of the filter is dependent upon the design. Thus it would have been obvious to one of ordinary skill in the art to have a mid-range band-pass filter have the slope as claimed in order provide a loudspeaker system with better fidelity.

Claim 6 claims the crossover network of claim 5, further comprising at least one constant resistance network operatively connected to at least one of said low-pass filter and said high-pass filter so that said crossover network presents a substantially constant impedance at said signal input across a predetermined frequency range. As stated above apropos of claim 2, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 3 with the exception of the claimed matter. Modafferi discloses a multi-driver loudspeaker apparatus with improved crossover filter circuits and teaches of the concept of constant resistance (column 9, lines 1-5) and the loudspeaker apparatus covering a frequency range of 20Hz to 20KHz (column 24, lines 37-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to use Modafferi's concept of a constant resistance as claimed because it is conventional to the art that most passive crossover networks are synthesized on the basis that the network is terminated by a constant resistance.

Claims 8 and 10 claim the multi-driver loudspeaker system of claim 7 and the multi-driver system of claim 9 respectively, further comprising operatively connecting at least one constant resistance network to a signal input of said crossover network, whereby said multi-driver loudspeaker system presents a substantially constant impedance at said signal input across a range of frequencies of approximately 20 Hz to 20KHZ at said signal input. As stated above apropos of claim 2, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 3 with the exception of the claimed matter. Modafferi discloses a multi-driver loudspeaker apparatus with improved crossover filter circuits and teaches of the concept of constant resistance (column 9, lines 1-5) and the loudspeaker apparatus covering a frequency range of 20Hz to 20KHz (column 24, lines 37-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to use Modafferi's concept of a constant resistance as claimed because it is conventional to the art that most passive crossover networks are synthesized on the basis that the network is terminated by a constant resistance.

Claim 9 claims the multi-driver loudspeaker system of claim 7, wherein said loudspeaker system further comprises a mid-range driver, said crossover network further comprising a mid-range band-pass filter operatively connected to said signal input and to said mid-range driver, said mid-range band-pass filter having a substantially infinite upper frequency slope and a relatively shallow lower frequency slope. As stated above apropos of claim 1, Combest meets all elements of that claim. Therefore, Combest meets all elements of claim 5 with the exception of a mid-range band-pass filter having a substantially infinite upper frequency slope and a relatively shallow lower frequency slope. Modafferi's discloses a midrange band pass filter and teaches that solving for a particular transfer function yields results that correspond to both an infinite band-edge slope and a finite band-edge slope (column19, lines 35-49). Although, he does not specifically discloses the claim language, it is obvious that the frequency slope(s) of the filter is dependent upon the design. Thus it would have been obvious to one of ordinary skill in the art to have a mid-range band-pass filter have the slope as claimed in order to provide a better loudspeaker system having better fidelity.

7. **Claims 11and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Modafferi (U.S. Patent 4,771,466) in view of Kim (U.S. Patent 5,530,770).

Regarding claims 11 and 12, Modafferi discloses a crossover network for a loudspeaker system comprising at least a high-frequency driver (tweeter) and a low-frequency driver (woofer), said crossover network having a transfer function comprising a pole cluster having at least two poles and at least one zero, said at least one zero falling along an imaginary axis of a plot of said transfer function at an approximately infinite distance form the origin of said imaginary axis (Figure 11). Modafferi fails to disclose a crossover network comprising a transformer. However this concept was well known in the art as taught by the Kim. Kim discloses a crossover network comprising a transformer (Figure 1). Modafferi discloses using poles and zeros of "brick-wall" functions and teaches of adjusting the crossover circuit components until the accuracy of its approximation to the equation for "perfect fidelity" (column 1, lines 55-65) . It would have been obvious to one of ordinary skill in the art at the time of the invention to have the transformer disposed such that at least one zero is moved to a point proximate said pole cluster thereby creating a band edge frequency response that approximates a brick wall function (Figures 12a-12c; column 4, lines 50-60) in order to produce the best fidelity possible.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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XU MEI
PRIMARY EXAMINER